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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/071,097	02/11/2002	Atsuko Yamaguchi	520.41158X00	1559

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EXAMINER

CARTER, AARON W

ART UNIT

PAPER NUMBER

2625

DATE MAILED: 10/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

✓ 10/071,097

Applicant(s)

YAMAGUCHI ET AL.

Examiner

Aaron W. Carter

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2-6 and 10 is/are allowed.
- 6) ☒ Claim(s) 7-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This action is responsive to papers filed on August 8, 2005.

Response to Amendment

2. In response to applicant's amendment received on August 8, 2005, all requested changes to the specification and claims have been entered. Claims 1 and 11 have been cancelled.

Response to Arguments

3. Applicant's arguments see Remarks, pages 8-11, filed August 8, 2005, with respect to claims 2 have been fully considered and are persuasive. The 35 USC 102 rejections of claims 2-4 have been withdrawn.

4. Applicant's arguments, see Remarks, page 11, filed August 8, 2005, with respect to the rejection(s) of claim(s) 7 and 8 under 35 USC 102 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Abboud (already of record).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Munesada (already of record) in view of Abboud (already of record).

As to claim 7, Munesada discloses a circuit pattern inspection method comprising:

A step of mounting a sample processed in a line pattern shape at a predetermined pitch on a scanning microscope, observing said sample, and obtaining a two-dimensional intensity distribution (column 4, line 60 – column 5, line 11);

A step of calculating a shape of roughness of an edge of said line pattern from said two-dimensional intensity distribution (column 5, lines 30-50); and

A step of storing said edge roughness shape obtained as image distortion information (column 5, lines 30-50, wherein it is inherent that in order to further process the edge roughness shape that it is stored).

Munesada does not disclose expressly obtaining a two-dimensional intensity distribution of secondary electrons or reflected electrons.

Abboud discloses

A charged particle optical system for irradiating a sample with a charged particle beam emitted from said charged particle source through a condenser lens (Fig. 3, element 52), a deflector (Fig. 3, element 60, “deflector”), and an object lens (Fig. 3, element 62), deflecting the beam and performing the scan with the beam;

A stage on which a sample is to be mounted (Fig. 3, element 68);

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observing said sample and obtaining a two-dimensional intensity distribution of secondary electrons or reflected electrons (Fig. 3, element 60, “scanner”).

Munesada & Abboud are combinable because they are from the same art of image processing, specifically circuit pattern inspection.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the device, taught by Abboud, for observing the intensity distribution secondary or reflected electrons, in the circuit pattern inspection method disclosed by Munesada.

The suggestion/motivation for doing so would have been to provide the sharper corners and more precisely defined lines (column 3, lines 22-23).

Therefore, it would have been obvious to combine Munesada with Abboud to obtain the invention as specified in claim 7.

As to claim 8, the combination of Munesada and Abboud discloses a circuit pattern inspection method comprising:

A step of mounting a sample processed in a line pattern shape at a predetermined pitch on a scanning microscope, observing said sample, and obtaining a first two-dimensional intensity distribution of secondary electrons or reflected electrons (Munesada, column 4, line 60 – column 5, lines 11 and Abboud, Fig. 3, element 60, “scanner”, as discussed above for claim 7);

A step of moving an observation position in the direction of a side of said line pattern only by a predetermined length and obtaining a second two-dimensional intensity distribution of secondary electrons or reflected electrons (Munesada, Fig. 1, element 23 and 22 and column 5, line 60 – column 6, line 3 and Abboud, Fig. 3, element 60, “scanner”);

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A step of computing a sum of said first and second two-dimensional intensity distributions (Munesada, Fig. 1, element 15 and column 8, lines 20-34);

A step of calculating a shape of roughness of an edge of said line pattern from said sum data (Munesada, Fig. 1, elements 16-19 and column 8, lines 20-50); and

A step of storing said edge roughness shape obtained as image distortion information (Munesada, column 8, lines 20-50, wherein it is inherent that in order to further process the edge roughness shape that it is stored).

As to claim 9, the combination of Munesada and Abboud discloses the circuit pattern inspection method according to claim 8, further comprising a step of calculating an image offset amount in the direction perpendicular to an edge of a line pattern in an observation area from said image distortion information obtained and correcting a third two-dimensional intensity distribution of secondary electrons or reflected electrons obtained as a result of observing an arbitrary sample or a pattern edge position obtained from said third two-dimensional intensity distribution (Munesada, column 8, lines 35-39).

Allowable Subject Matter

7. Claims 2-6 and 10 allowed.

The following is an examiner's statement of reasons for allowance:

As to claim 2, none of the prior art teach or fairly suggest a step of displaying correlation between edge roughness shapes of different line edges, in combination with the other limitations of claim 2, as discussed by the applicant in the Remarks, pages 8-11, filed on August 8, 2005. The prior art of Munesada discloses a circuit pattern inspection method, detecting edge point by a threshold method, obtaining a approximation line by least square and obtaining an edge roughness shape, but does not teach or fairly suggest a step of displaying correlation between edge roughness shapes of different line edges as disclosed in claim 2.

As to claim 10, please refer to the reasons for allowance discussed in the previous action mailed on March 7, 2005.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron W. Carter whose telephone number is (571) 272-7445. The examiner can normally be reached on 8am - 4:30 am (Mon. - Fri.).

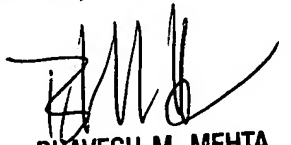
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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